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BUREAU OF LAND MANAGEMENT

(MISSOURI RIVER BASIN INVESTIGATIONS)

LAND PLANNING AND CLASSIFICATION REPORT
Of the Public Domain Lands

in

LOWER YELLOWSTONE AREA

Montana and North Dakota

Region III
Billings, Montana
March, 1949

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This report was compiled as part of the program of the Department of the Interior for the development of the resources of the Missouri River Basin.

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PURPOSE AND SCOPE

The preliminary report and map presents, in a general way, a compilation of pertinent factual information and data gathered from many sources as relates to the remaining unappropriated and unreserved public domain lands which lie in the Lower Yellowstone area. The purpose of this study has been to ascertain the basic facts pertinent to the formation of a sound program for the management, use or disposition of the public domain lands which remain in this area. It is important to know how these public lands can best serve in the coordinated program of the development and utilization of the land and water resources of the Missouri River basin. While the relatively small percentage of public domain lands in the Yellowstone River basin may have but little influence on the total economy of the area, their existence, nevertheless, poses definite problems which require attention.

SUMMARY

The Lower Yellowstone area, as herein described, is located in eastern Montana and western North Dakota and includes nearly 7,000 square miles of watershed area of the Yellowstone River and tributaries from the mouth of Powder River, Montana, to the confluence with the Missouri River in North Dakota, 150 miles downstream.

Most of the area is devoted to the production of livestock. Crop production is carried on under both irrigation and dry-farm practices, the principal crop grown under the latter practice being wheat. Approximately 100,000 acres of crop lands are irrigated and alfalfa, sugar beets, small grains, beans and mixed hay comprise the principal crops.

The public domain lands, administered by the Bureau of Land Management, comprise about four percent of the total project area, or 192,753 acres. Most of these lands are located in the breaks and badlands flanking the Yellowstone River in Montana. The remainder are scattered promiscuously throughout the area as isolated tracts of varying sizes and character. The public domain lands which remain have the common characteristic of limited usefulness and value because of climatic and physical limitations, and are, therefore, primarily valuable for the grazing of livestock.

A picture of the diversity of Federal and State land management programs is illustrated by the following activities within the area: Two Taylor Grazing Districts, one Public Domain administrative program, four State Cooperative Grazing Districts, eight Soil Conservation Districts, two State land leasing programs, three Land Utilization project areas, ten Production and Marketing Administration conservation programs, ten county extension programs, three Case-Wheeler irrigation projects, two State Water Conservation Board irrigation projects and three Bureau of Reclamation projects.

The problems as relate to the public domain lands will require further study. Detailed examination and classification of each individual tract of public domain land is necessary to determine the resources, their condition and the highest uses to which the lands can be placed and integrated with the existing and proposed land management programs of the Bureau of Land Management or other Federal and State Agencies. The principal problems relating to the management, protection, development and disposition of the public domain lands and their resources are those of watershed impairment through soil and forage depletion, maladjustments in land use, complexity of land ownership and operating patterns and ineffectual or incomplete integration of land uses for the greatest public benefit.

The present study has not been of sufficient detail to determine the scope and seriousness of these problems nor to prescribe measures to cope with them. Additional studies will be required to obtain the basic data necessary to the solution of these and other problems pertaining to the public domain lands.

PHYSICAL FEATURES

Location and Size

The Lower Yellowstone area, as described in this report, comprises nearly 7,000 square miles of watershed area in eastern Montana and western North Dakota. It includes the drainage of the Yellowstone River and its tributaries from the mouth of Powder River in Montana to the confluence with the Missouri River in North Dakota. The length of the area is about 150 miles and the maximum width is 75 miles.

Drainages

The tributary drainages within the area yield no consequential amount of perennial run-off, although the average annual discharge at the mouth of the Yellowstone River is nearly seven million acre feet. O'Fallon Creek and Cabin Creek are the principal tributary drainages of the area under consideration in this report.

Topography and Physiography

The topography of the region ranges from nearly level to moderately rolling to hilly upland plains separated by local areas of "breaks" and badlands flanking the principal drainages. The river occupies a valley consisting in general of a broad alluvial flood plain bordered by terraces or rough breaks which separate it from the rolling upland plains.

Elevations range from 1,860 feet at the mouth of Yellowstone River in North Dakota to a maximum of about 3,500 feet in the upland reaches of O'Fallon Creek in Carter County, Montana.

Perhaps the most pronounced physiographic features are the badland areas flanking the east side of the river near Glendive, Montana. Scattered lignite beds which have burned leaving clinker beds or scoria is another conspicuous feature of the landscape.

Climate

The climate of the area is continental, characterized by low and relatively erratic rainfall, cold winters, and warm summers. The average annual precipitation, for weather stations within or adjacent to the area ranges from 13.16 to 14.93 inches, most of which falls from May through September. The average frost free period for stations adjacent or within the area ranges from 126 days at Sidney, Montana to 158 days at Miles City, Montana. The maximum temperature recorded in the area is 117 degrees Fahrenheit at Glendive, Montana, and the minimum temperature recorded is 50 degrees below zero for the same station.

Geology and Soils

The Fort Union formation occupies the surface of most of the Lower Yellowstone area. In the intervening area, portions of the older Lance and Bearpaw formations are exposed. The Fort Union formation consists of alternating series of beds of sandstones and shale laid down as continental deposits. Resistant bands of scoria form capping of hills and ridges. The Lance formation is exposed as a narrow irregular band from Glendive, Montana, and southeast. This formation, like the Fort Union, consists of alternating bands of shales and sandstones, but beds of scoria are lacking. The Bearpaw formation is the oldest exposed formation and consists of soft shales. The line dividing the Lance sandstone from the soft Bearpaw shale is nearly always well marked by an escarpment facing the Bearpaw area which occupies the smallest area of the three exposed formations.

In the Yellowstone Valley and in the larger tributary streams riverwash, composed of unmodified incoherent gravels and sands, are found as islands, bars or low tracts which are periodically overflowed by high waters. Low in organic matter and with excessive internal drainage, the material in most places is devoid of vegetation but here and there it supports a scattered growth of brush or willows. It is valuable mainly for the scant pasturage it affords. Small scattered areas of undeveloped, poorly drained clay or loam soils occupy depressions, on which the vegetation is commonly either salt grass or cattail. Some areas in the bottom lands have become affected by the accumulation of salts owing to seepage from higher land, impermeability of the soil or its low position with respect to surface drainage or ground water table. The soils of the valley bottoms are for the most part, however, well drained and porous, although usually low in organic content. The bench lands and terraces of the Yellowstone valley are former floors of old alluvial plains, the soils of which vary from very fine sandy loams to heavy clays with substrata of fine sands and gravel. Heavy soils, derived from colluvial-alluvial sediments brought down from adjacent areas of shale often contain soluble salts in high concentrations.

In the breaks and badlands, the soils are derived from eroded sandstones and shales. Excessive erosion and dissection of soft rocks have produced a bare and rugged landscape in such areas. In many places these soils contain large quantities of alkali and masses of gypsum crystals. Although these areas have little value for any use, some grazing is afforded and some areas have limited recreational value.

The soils of the uplands are for the most part developed over sandstones and shales and are principally light colored sand loams and clay loams. The greater part of this area is devoted to livestock grazing and is considered sub-marginal for successful dry farming.

Area Economy

The economy of the area is based primarily upon crop and livestock production. Most of the area is devoted to the production of livestock. In total number, sheep predominate and cattle are next in importance. Most of the crop production is carried on under dry-farm practices. The principal crop grown under dry-farming is wheat. Approximately 100,000 acres lying adjacent to the Yellowstone River within the area are irrigated. The principal crops produced under irrigation are alfalfa, sugar beets, small grains, beans and mixed hay. Most of the arable land was used for grazing in the early settlement period. The homestead boom of 1900-1920 resulted in the conversion of much of the grazing land to farms. During the depression and drouth years of the thirties, large areas of farmland were abandoned and allowed to revert to native grass which are now used for grazing.

The Lower Yellowstone area is sparsely populated, having a population of approximately 25,000. The largest town in the area is Glendive, Montana, with a population of 4,524 in 1940. Sidney, Montana, is the second largest town in the area with a population of 2,978 in 1940. All of the remaining towns have populations of less than 1,500.

A branch line of the Northern Pacific Railroad, paralleling the Yellowstone River, runs through the entire area in a north-south direction. The main line of the Northern Pacific Railroad enters the area on the south and parallels the Yellowstone to Glendive where it turns east. A branch line of this railroad also goes west through the area from Glendive. The main line of the Chicago, Milwaukee and St. Paul services the southern portion of the area. A branch line of the Great Northern Railroad runs south and east of Buford, North Dakota to Richey, Montana and east through the northern portion of the area in North Dakota. U. S. Highway No. 10 parallels the Yellowstone River from the southern portion of the area northward to Glendive where it turns east. U. S. Highway No. 12 runs east-west through the southern portion of the area. State and County Highways adequately service most of the remaining area. All of the larger towns have good schools and other public facilities.

Land Management Program for Public Domain Lands Administered by the Bureau of Land Management.

The public domain lands within this project area are primarily valuable only for the grazing of livestock because of climatic limitations, soil types and topography. The public domain aggregates 192,755 acres, the greater part of which is located as fairly compact blocks chiefly in the breaks and badlands skirting the Yellowstone River valley in Dawson and Prairie Counties, Montana. The remainder are promiscuously scattered throughout the area as isolated tracts of varying sizes and character but with the common characteristic of limited usefulness and value. The public domain lands, administered by the Bureau of Land Management, comprise about four percent of the total project area. The extent of such holdings among counties within the project area varies from none in McCone County, Montana, to six percent in Prairie County, Montana. The largest holdings are found in Dawson County, Montana and comprise nearly 67,000 acres or one third of all the public domain in the project area (See Table 1).

The Taylor Grazing Act, approved June 28, 1934, and amended June 26, 1936, was enacted to stop injury to the public grazing lands by preventing overgrazing and soil deterioration; to provide for their orderly use, improvement and development; to stabilize the livestock industry dependent upon the public range and for other purposes. In order to promote the highest use of the public domain lands pending its final disposal, the Secretary of the Interior was authorized to establish grazing districts embracing vacant, unappropriated and unreserved public domain land in the United States. This Act also provided that where public lands are so situated as not to justify their inclusion in any grazing district, to lease any such lands for grazing purposes.

Table 1 – Land Ownership by States and Counties within the Lower Yellowstone Area – 1949 (acres)

State and County	Public Land Administered by Federal Agencies					Other Lands Private, Railroad, County and State Owned	Area all Classes of Land Ownership
	Bureau of Land Management		Title III Purchase Soil Conservation Service	Reclamation Withdrawal Bureau of Reclamation	Total Federal Lands (all Agencies)		
	Within Grazing Dist.	Outside Grazing Dist.					
Montana							
Carter	4,144	–	–	–	4,144	175,056	179,200
Custer	2,541	–	24,678	–	27,219	81,581	108,800
Dawson	66,855	–	12,809	1,493	81,157	1,152,763	1,233,920
Fallon	24,907	–	56,171	–	81,078	589,642	670,720
McCone	–	–	–	–	–	5,120	5,120
Prairie	48,787	–	270,150	–	318,937	472,103	791,040
Richland	–	17,668	–	346	18,014	701,346	719,360
Wibaux	–	27,419	–	–	27,419	301,541	328,960
Total Area	147,234	45,087	363,808	1,839	557,968	3,479,152	4,037,120
North Dakota							
Golden Valley	–	80	–	–	80	41,520	41,600
McKenzie	–	354	8,402	200	8,956	439,044	448,000
Total Area	–	434	8,402	200	9,036	480,564	489,600
Total Area Montana and North Dakota	147,234	45,521	372,210	2,039	567,004	3,959,716	4,526,720

The greater part of the public domain in the Lower Yellowstone area is included in Montana Grazing Districts No. 2 and No. 3. Of the total public domain, 147,234 acres within these two grazing districts, about 67,000 acres is within Montana Grazing District No. 2 and 80,324 acres is within District No. 3. This comprises about five percent of the total land area within the grazing districts. Permits or licenses for grazing privileges on the public lands are granted to qualified applicants engaged in the livestock business and who own or control sufficient base property that will, when used with public land, provide for a year round operation. Class and numbers of stock, and seasons or period of use, are specified in the permit. The permits are usually for a term of ten years but can be amended, reduced or even cancelled under certain conditions. Grazing use of the public domain with grazing districts is integrated with the use of the base properties or the privately owned or controlled lands of the operator, so that together the public and privately controlled lands, and other lands such as other publicly acquired lands, form a year-long operation for the class and numbers of livestock that the unit will support without damage to the land or its resources. Thus, the loss of any material part of either the privately controlled base property or the public range may cause a serious disturbance to an established operation.

Public domain lands, which lie outside of established grazing districts, comprise about 45,521 acres and as shown in Table No. 1, are located in Richland and Wibaux Counties, Montana, and in Golden Valley and McKenzie Counties, North Dakota. They comprise less than three percent of the total land area of these respective counties and only one percent of the Lower Yellowstone area. Nearly all of these lands are leased for grazing purposes as prescribed under Section 15 of the Taylor Grazing Act. Stockmen owning or controlling adjacent privately owned lands have a preference right in such leases. Leases are usually for a period of ten years. The leased public domain is used in conjunction with that of privately owned or controlled lands in supplying feed for all or part of the livestock operated for definite periods of the year.

Existing and Proposed Irrigation Developments

Irrigation projects on the main stem of Yellowstone River, within the Lower Yellowstone area, contain a total irrigable area of approximately 102,000 acres, of which 20,600 acres lie in North Dakota and 79,400 acres in Montana.

The largest project, the Lower Yellowstone, was constructed by the Bureau of Reclamation in 1906 and is the only gravity project in the group and until 1937 was the only significant irrigated area below Miles City. All others are pumping projects, none of which has been built with private capital. Construction of the Kinsey project was begun in 1937 by the Farm Security Administration and is now operated by the Soil Conservation Service. The Buffalo Rapids project was begun in 1937 by the Bureau of Reclamation and the first two divisions are now in operation under the general supervision of the Soil Conservation Service.

The Sidney project was developed by the Montana State Water Conservation Board in 1938 and the Sioux project by the North Dakota State Water Conservation Commission in 1939. The total irrigable area of these six operating projects is as follows:

Project	State	Acres
Kinsey	Montana	7,200
Buffalo Rapids Divn. I	Montana	18,000
Buffalo Rapids Divn. II	Montana	13,600
Lower Yellowstone	Montana	37,300
Lower Yellowstone	North Dakota	19,900
Sidney	Montana	5,300
Sioux	North Dakota	700
	Total Area	102,000

The Case-Wheeler Act of 1939 authorized a new approach in irrigation development by utilizing the facilities and functions of both the Department of Agriculture and the Department of Interior in a joint undertaking. This law provides that the Bureau of Reclamation shall construct the main irrigation works and deliver water to each farm. The Department of Agriculture is responsible for dividing the land into family-sized farms, preparing the farms for irrigation by leveling, and construction of farm irrigation and drainage systems. This is done for individual operators at their request if the land is privately owned, or the farms are prepared and sold to farm families when development is complete where government owned land is involved.

There are three (3) approved Case-Wheeler projects in the Lower Yellowstone area. They are: Buffalo Rapids, Division I; Buffalo Rapids, Division II; and Intake. Work on the Buffalo Rapids project, Division I, is practically complete; some farms were sold last year and another group is being sold this year. Land development is almost complete on Division II. The Buffalo Rapids project is being used as an example of irrigation development where crop production from the entire irrigable acreage is attained in a very short period compared with the usual type of irrigation development and settlement. About 36,000 acres is now under irrigation. The accelerated program of irrigation development in these projects was aided by the Department of Agriculture's participation under the Case-Wheeler legislation. Under the plan of pre-development for irrigation, the entire irrigable acreage of a project may be in production within a short time after water is available. The Soil Conservation Service, in addition to preparing the land for irrigation on an individual farm basis, provides farm planning services and technical assistance to the farmer in irrigation practices and cropping problems. Reports indicate that all of the approved Case-Wheeler projects in the Lower Yellowstone area will be completed and the government owned acreage ready for sale into private ownership within the very near future. A number of these farms serve as base property in support of grazing permits on nearby public domain lands, although no detail study has been made of this interrelated land use.

Proposed irrigation projects along the Yellowstone River are located on flood plains or on terraces rising 25 to 300 feet above the present river level. They are scattered along the valley in small units. According to the Bureau of Reclamation plans, the projects and respective irrigable areas are as follows:

Area	State	Acres
Saugus-Calypso	Montana	2,470
Buffalo Rapids Divn. III	Montana	13,440
Cracker Box	Montana	800
Colgate	Montana	1,300
Stipek	Montana	4,800
Intake	Montana	840
Savage	Montana	2,390
Elm Coulee	Montana	1,800
Seven Sisters	Montana	1,800
Sidney Extension	Montana	2,450
Cartwright	North Dakota	950
	Total Area	33,040

Elm Coulee, Intake and Buffalo Rapids Division III, irrigation projects, will directly involve public domain land and Reclamation withdrawal of such land will be made. Further studies will be required to determine their highest use of all the public domain lands in a coordinated developmental program.

Four Cooperative State Grazing Districts are in operation in the area (see map). They include: (1) Red Butte Cooperative State Grazing District (Fallon County) (2) Fallon Creek Cooperative State Grazing District (Fallon County) (3) East Custer Cooperative State Grazing District (Custer County) and (4) Prairie Cooperative State Grazing District (Prairie County).

Table 2 Carrying capacity of lands by ownership within
Cooperative State Grazing Districts
in the
Lower Yellowstone Area
1949

	Federal Range		Title III - SCS 1/		Other Lands		Total	
Name	Acres	Aum 2/	Acres	Aum 2/	Acres	Aum 2/	Acres	Aum 2/
Red Butte	1,516	504	11,527	3,842	7,328	2,441	20,371	6,787
Fallon Creek	12,114	3,856	44,644	12,600	16,917	5,330	73,675	21,786
East Custer	2,541	800	24,678	7,500	81,781	23,400	109,000	31,700
Prairie	48,787	8,200	270,150	62,000	472,063	120,000	791,000	190,200
Total Area	64,958	13,360	350,999	85,942	578,089	151,171	994,046	250,473

1/ Soil Conservation Service
2/ Animal Unit Month

These non-profit Cooperative State Grazing Districts were established under authority of the "Grass Conservation Act", enacted by the legislative assembly of the State of Montana on March 15, 1939 (Chapter 208, Session Laws of Montana, 1939). Section One of the Act states that its purpose is to "provide for the conservation, protection, restoration and proper utilization of grass, forage and range resources of the State of Montana; to provide for the incorporation of cooperative non-profit grazing districts, to provide a means of cooperation with the Secretary of the Interior as provided in the Federal Act known as the Taylor Grazing Act and any other Governmental Agency or Department having jurisdiction over lands belonging to the United States or other State of Federal Agency as well as agencies having jurisdiction over Federal Lands, to permit the setting up of a form of grazing administration which will aid in the unification or control of all grazing lands within the State where the ownership is diverse and the lands intermingled and to provide for the stabilization of the livestock industry and the protection of dependent commensurate ranch properties as defined herein. This act provides a State Grass Conservation Commission to assist in carrying out the purposes of this act, to act in an advisory capacity with the State Land Board and County Commissioners, and to supervise and coordinate the formation and operation of districts which may be incorporated under this act".

Cooperation between each cooperative State Grazing District and the Bureau of Land Management is obtained through a cooperative agreement, the purpose of which is to provide for the protection, administration, regulation and improvement of the public domain and to bring about a better coordination of the use of the public domain and the State district lands subject to the agreement, and the privately owned lands used in connection therewith, and to take all necessary steps to protect such lands from overgrazing and improper use. By virtue of this agreement, the Bureau of Land Management issues to the State Cooperative Grazing Districts an annual permit for grazing privileges which may be utilized on the public domain lands by qualified licensees or permittees. (See Table 2)

Eight organized Soil Conservation Districts are all or partly contained within the project area. These districts have been organized pursuant to the Soil Conservation Districts Law of the States of Montana and North Dakota as governmental subdivisions of the State and are authorized to cooperate with and obtain assistance from any private, State or Federal Agency in carrying out soil and moisture conservation operations and in effecting wise land use on all private, State and Federal lands within its boundaries upon obtaining consent of the landowners or agencies having jurisdiction thereof. The organized districts and their location within the project area are as follows:

Box Elder Soil Conservation District, Carter and Fallon Counties, Montana.
Little Beaver Soil Conservation District, Fallon County, Montana.
Dawson Soil Conservation District, Dawson County, Montana.
McCone Soil Conservation District, McCone County, Montana.
Mona-Andes Soil Conservation District, Richland, Montana.
Wibaux Soil Conservation District, Wibaux County, Montana.
Arnegard-Alexander, McKenzie County, North Dakota.
Lower Yellowstone, McKenzie County, North Dakota.

These districts are shown on the map appendix.

The objectives of these locally organized and locally managed districts are to provide for the conservation, protection, restoration and proper utilization of the forage and cropland resources; to present and control soil erosion; to secure both soil and moisture conservation on a voluntary basis with individual cooperators within the districts; to maintain and build up the productivity of the land and to develop the area to effectuate the most desirable utilization of the land in order to promote the health, welfare and raise the standards of living of the people residing thereon.

With respect to the public domain lands administered by the Bureau of Land Management, field agreements are entered into between the Districts and the Bureau of Land Management for the purpose of establishing a basis of cooperation and mutual assistance and to coordinate and integrate their respective activities and efficiently utilize the resources available for carrying out soil and moisture conservation and thereby promote wise land use on all lands in the district.

Land Management Programs Administered by Soil Conservation Service

During the latter 30's, Congress passed legislation authorizing a land purchase program to overcome some of the more critical land use maladjustments. This purchase program was initiated with emergency funds in 1934, and 1935, as a relief measure and later was carried on under authority of Title III of the Bankhead-Jones Farm Tenant Act of 1937. The purchased lands in the Lower Yellowstone area are now administered by the Soil Conservation Land Utilization projects. Three such projects are located partly within the Lower Yellowstone area, namely: (1) Southeastern Montana, Land Utilization Area No. 21, (2) Lower Yellowstone (Montana), Land Utilization Area No. 4 and (3) Little Missouri (North Dakota), Land Utilization Area No. 24. With the exception of a comparatively small acreage, the Title III lands are leased for grazing purposes to local stockmen under terms of agreement between the Soil Conservation Service and the Districts. They are managed by local boards in accordance with the terms and conditions of their lease, rates and regulations prescribed by Soil Conservation Service.

Table 1 indicates the extent of such land purchase programs by counties within the project area. The object of such purchases has been to balance the land resource with the population dependent upon it for support. The policy has been to shift land use practices from precarious and frequently disastrous cash grain farming to a combination of forage cropland-range livestock production. The act prohibits the sale of any such acquired lands into private ownership. An amendment to the act does permit land exchanges on an equal value basis. Consideration has been given by the Bureau of Land Management to the close relationship of the public domain with these acquired lands and how their coordinated use, management, development and improvement can best be achieved in the interests of individual and community welfare.

Under Public Act 46, 74th Congress, April 1935, the Soil Conservation Service is cooperating with Soil Conservation Districts in a soil and moisture conservation program. The Soil Conservation Service is also cooperating in a similar manner with the four Montana Cooperative Grazing Districts within the Lower Yellowstone area. Conservation practices are being carried out on the districts to reduce the effects of both wind and water erosion and practices are being installed to hold as much of the moisture on the land where it falls as possible.

Under Public Law 738, 74th Congress, Flood Control Act of 1936, and subsequent Acts, Congress has given the Department of Agriculture the responsibility for Flood Control activities, including preliminary examinations, survey reports and operations on the watersheds in the Lower Yellowstone area. The Forest Service administers the program on forest lands and the Soil Conservation Service administers the program on private watershed lands.

The Department through these agencies is carrying on a watershed flood control survey of the entire Lower Yellowstone area at this time. The program of watershed treatment outlined in the survey report will be submitted to the 81st Congress. If Congress authorizes the report and makes money available for operations, the Soil Conservation Service will develop work plans on sub-watersheds which will be the basis for the establishment of works and measures for flood control.

Flood control operations will consist of two independent parts (1) work on the farms, ranches, and woodlands to reduce erosion and retard run-off. This work is going on now but should be accelerated; (2) work on the tributary areas to reduce damage caused by flood water and sediment. This phase of work will be undertaken if and when Congress authorizes the survey reports and makes funds available for flood control.

Detailed surveys are being made by the Soil Conservation Service on Muster Creek tributary to the Kinsey Irrigation project to determine feasible methods of treatment necessary to reduce damages to the project caused by flood water and sedimentation. Some structural treatment has been applied in this area to reduce such damages but have proven inadequate.

The Agricultural Conservation Program (A.A.A.) under the Production and Marketing Administration, provides for making payments to farmers and ranchers to assist them in carrying out soil and moisture conservation practices on privately owned and controlled lands. The need for effective utilization of grazing lands and the scarcity of stock water resulted in the development of numerous stock water supplies, many of which have directly or indirectly benefitted adjoining public domain range lands. Other conservation practices such as fencing, range reseeding and water spreading have also had an important beneficial effect upon the proper utilization and restoration of these range lands.

Proposed "Badlands State Park"

Local interest has been intermittently shown for the creation of a state park in the badlands area in Township 15 North, Range 56 East, south of the city of Glendive, Montana, the largest town in the project area. This area is about the only local area which offers any scenic attraction that can be considered open to the public. Local residents refer to the area as the "Badlands Park" and use accessible portions of the area considerably as a picnicking ground and for its scenic attraction. In general, the area consists of eroded clay and shale hills, with deeply incised gullies and outcroppings of sandstone. There are a few small seeps and springs but lack of water limits the use of the area by livestock. Some petrified wood is found in the area and various fossils have been frequently reported found by fossil hunters who explore the exposed formations as a pastime. The area is within the grant limits of the Northern Pacific Railroad and alternate sections were granted to the railroad, much of which has since been sold to private owners. Railroad lands comprise about 30 percent of the area, public domain 25 percent, State and County lands 10 percent, with the remaining 35 percent in private ownership. The total area consists of about 20,000 acres which may have a greater value for scenic and recreational purposes than for the grazing of domestic livestock. Mule deer were planted in the area in 1944 by the Montana State Fish and Game Department, and at last reports, had increased to some extent in population.

It is important that the public interest be recognized in the overall land use program in view of the past interest shown by the local people and Civic organizations in having the recreational values of the lands given consideration and official recognition. The Eleventh Annual Report (1938) of the Montana State Forester recommended the area as a potential state park. Officials of the National Park Service have expressed their opinion that while the area does not excel various badland formations in other parts of Montana or North Dakota, which exemplify similar types of erosion in a high degree, it nevertheless appears to be of state park caliber.

Problems as relate to public domain lands

Detailed examination and classification of each individual tract of public domain land within the Lower Yellowstone area is necessary to determine their land and water resources. This information is required to determine the highest use to which the public lands can be placed in the existing and proposed land management programs in the area by the Bureau of Land Management or other Federal or State Agencies. This study will also determine if and what public lands in the area can be more economically and effectively used in private ownership.

In the event that the base properties of an existing livestock operator should be included in a reclamation development program, it is possible that the existing attached range privileges might be apportioned among other operators including operators of new farm units. The relatively small amount of public domain lands remaining in the area, however, will ordinarily preclude such a possibility. Since public ranges are fully stocked, new farm units to be established as a result of an expanded irrigation project would have little opportunity to obtain the use of adjacent or nearby public domain range lands to supplement feed produced on these units.

Any material expansion of livestock operations on these units and beyond the capacity of these units, will generally be through purchase or development of private properties. The general economy of the range areas, wherein are located most of the public domain lands, will undoubtedly be improved through additional irrigation development even if some disturbance will result to some individual livestock operators through the loss of base properties. An expanded irrigation program will furnish not only additional cultivated feeds needed in livestock production in the area but will also furnish additional pastures, roughage and concentrates for the feeding and fattening of livestock for market. The additional feed produced can easily find an outlet locally thereby increasing feeding operations and adding to the wealth of the community. Further detailed studies are necessary, however, to determine the relationship between the irrigated farm units and the grazing use of the adjacent public domain lands.

Normal erosion taking place on the extensive heavy clay soils in the badlands is generally a more serious problem than the accelerated form on farmlands. Not only is soil removal quite active but the problem of siltation is serious. These soils are susceptible to high run-off of erosion and at best carry only a light cover of vegetation and, therefore, considerable care must be exercised in its grazing use. Much of the public domain lands are located in areas of this character and use by domestic livestock is made principally during the winter season.

Wildlife, including deer and antelope, fur bearers and game birds are a resource of the area which should be considered in connection with a land use and conservation program. It is recognized that there is a heavy demand from the local public for an increased big game population in this area. It is also recognized that the range livestock and ranching business is one of the principal industries and one which depends upon the public and private range lands for its existence. These conflicting demands must be kept in balance with available feed resources and in keeping with proper land use practices all of which is contingent upon the full cooperation of both public and private land holding interests. To promote the welfare of all interests insofar as public domain lands were concerned, an agreement was reached in 1945 between the Bureau of Land Management and the Montana State Fish and Game Commission whereby the latter planted approximately 200 head of mule deer immediately south and east of the Yellowstone River in the vicinity of Glendive, Montana. The agreement provides for joint examination and action should a game problem arise which involves public domain lands.

The Bureau of Land Management has constructed two stock water reservoirs, 6½ miles of fence and one spring development on public lands in the area. The value of these improvements is estimated to be about $5,000. The need for additional improvements on public lands, while not as yet known in detail, is not considered to be great. The need for structural rehabilitation is perhaps greatest in the rough breaks and badlands which flank the Yellowstone River. Siltation and sedimentation problems on public lands in such areas will require further study to determine feasible methods of treatment.

Woodland resources in the area are confined almost exclusively to a relatively small region located in Township 13 North, Range 56 East, Montana Principal Meridian. The area provides shelter for wildlife. Since much of the timbered area is public domain, further studies should be made to determine the most effective means of managing the woodland and grazing resources in keeping with proper land use practices.

Submitted by Harold T. Tapk

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BUREAU OF LAND MANAGEMENT

MISSOURI RIVER BASIN INVESTIGATIONS

LAND PLANNING AND CLASSIFICATION REPORT
Of the Public Domain Lands

in

LOWER YELLOWSTONE AREA

Montana and North Dakota

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